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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/723,307      | 11/26/2003  | Junghoon Lee         | NU22102             | 6841             |

7590 03/18/2005  
Mr. Edward J. Timmer  
P.O. Box 770  
Richland, MI 49083-0770

EXAMINER

MACK, COREY D

|          |              |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2855

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/723,307

Applicant(s)

LEE ET AL.

Examiner

Corey D. Mack

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 18-27 is/are rejected.
- 7) ☐ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/4; 1/31; 1/24/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: IDS of 6/30/04.

## DETAILED ACTION

### *Claim Objections*

1. Claim 12 is objected to because of the following informalities: the claim does not end in a "." ( period). Appropriate correction is required.
2. Claim 17 is objected to under 37 CFR 1.75(c) as being in improper form because a dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claim 17 not been further treated on the merits.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-16, 19, 21-24 and 25 rejected under 35 U.S.C. 102(b) as being anticipated by Darrow, et al. (US 6,480,730).
  - A. With respect to Claims 1, 16, 19, 21, 23, 24 and 25, Darrow discloses a sensor comprising a substrate 120 and a flat membrane 126 peripherally onnected to the substrate and having a surface where an interaction with a medium, particularly an analyte, occurs in a manner to deflect the membrane relative to the substrate (See Fig. 5).
  - B. With respect to Claims 2, 4 and 12, Darrow discloses that the membrane is elastomeric (polymer) and has a deflectable convex or concave shape (column 6, lines 12-26).

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C. With respect to Claims 3 and 22, Darrow discloses that the surface has a reaction agent thereon where a reaction agent thereon where a reaction with species of an analyte occurs in a manner to deflect the membrane relative to the substrate (column 2, lines 14-31).

D. With respect to Claim 5, Darrow discloses means 16 for detecting deflection of the membrane relative to the substrate.

E. With respect to Claim 6, Darrow discloses means for detecting a change in capacitance between electrodes associated with the substrate and the membrane by virtue of the deflection of the membrane 64, 105, 107.

F. With respect to Claim 7, Darrow discloses that the reaction agent comprises a coating 82 on the surface.

G. With respect to Claims 8, 9 and 10, Darrow discloses that the coating includes reaction molecules that provide chemical and/or biomolecular reaction sites (column 3, lines 10-37; column 4, lines 13-26).

H. With respect to Claim 11, Darrow discloses that membrane includes an interior surface subjected to gas pressure to impart a convex shape to the surface and an exterior surface having the agent (column 7, lines 8-27).

I. With respect to Claim 13, Darrow discloses that the membrane includes one or more metallic layers 74 imparting a convex or concave shape to the membrane (column 6, lines 12-27).

J. With respect to Claims 14 and 15, Darrow discloses that the membrane 126 comprises a ceramic material comprising silicon oxide or nitride (column 7, lines 36-56).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 18, 20, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darrow, et al. (US 6,480,730) in view of Beach, et al. (US 6,647,796).

A. With respect to Claims 18, 20 and 26, Darrow discloses the claimed invention, except they do not explicitly disclose a gas-containing gap that gas pressurizes the sensor when moved toward the substrate. Beach discloses an actuation area in gas flow communication with the sensor area and having an actuation membrane 20 spaced from the substrate 16 by a gas-containing gap 24 and movable in a manner to gas pressurized the sensor area when the actuation membrane is moved toward the substrate.

B. With respect to Claim 27, Darrow discloses the claimed invention, except they do not explicitly disclose depositing one or more metallic layers to constrain the membrane in an arcuate shape. Beach discloses thermally deforming the membrane and constraining the deformation by metallic layers 26a, 26b such that the membrane senses pressure changes in the microchannel (column 3, lines 1-34; column 4, lines 35-64). Therefore, at the time the invention was made, it would have been within the knowledge of one of ordinary skill in the art to include in Darrow thermally deforming the membrane and maintaining that deformation such that pressure changes within the membrane channel can be easily sensed.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey D. Mack whose telephone number is (571) 272-2181. The examiner can normally be reached on M-F, 8:30-4:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Corey D. Mack, Esq.  
Patent Examiner  
Art Unit 2855

March 9, 2005



HARSHAD PATEL  
PRIMARY EXAMINER